

Pearson BTEC Level 4 Higher National Certificate in Engineering (Electrical and Electronic Engineering)

Code: BHNCE4

Guided Learning Hours: 480 Hours

Programme Structure:

The Higher National Certificate (HNC) is a Level 4 qualification made up a minimum of 120 credits. This is made up of eight units, each with a value of 15 credits.

ELITC offers the following units of study for earning a Pearson BTEC Level 4 Higher National Certificate in Engineering (Electrical and Electronic Engineering).

No.	Unit Descriptions	Unit Level	Unit Credit
1	Engineering Design*	4	15
2	Engineering Maths*	4	15
3	Engineering Science*	4	15
4	Managing a Professional Engineering Project (Pearson-set)*	4	15
5	Electrical and Electronic Principles ⁺	4	15
6	Quality and Process Improvement	4	15
7	Digital Principles	4	15
8	Electronic Circuits and Devices	4	15
Total:			120

* *Mandatory Core Units*

⁺ *Mandatory Specialist Unit*

Unit Synopsis

Unit 1: Engineering Design (K/615/1475)	Unit Type: Core
Objectives Introduce students to the methodical steps that engineers use in creating functional products and processes; from a design brief to the work, and the stages involved in identifying and justifying a solution to a given engineering need.	
Learning outcomes Upon completion of this unit, student will be able to: <ol style="list-style-type: none">1. Plan a design solution and prepare an engineering design specification in response to a stakeholder's design brief and requirements.2. Formulate possible technical solutions to address the student-prepared design specification.3. Prepare an industry-standard engineering technical design report.4. Present to an audience a design solution based on the design report and evaluate the solution/presentation.	
Unit 2: Engineering Maths (M/615/1476)	Unit Type: Core
Objectives Develop students' skills in the mathematical principles and theories that underpin the engineering curriculum. Students will be introduced to mathematical methods and statistical techniques in order to analyse and solve problems within an engineering context.	
Learning outcomes Upon completion of this unit, student will be able to: <ol style="list-style-type: none">1. Identify the relevance of mathematical methods to a variety of conceptualized engineering examples.2. Investigate applications of statistical techniques to interpret, organise and present data by using appropriate computer software packages.3. Use analytical and computational methods for solving problems by relating sinusoidal wave and vector functions to their respective engineering applications.4. Examine how differential and integral calculus can be used to solve engineering problems.	
Unit 3: Engineering Science (T/615/1477)	Unit Type: Core
Objectives Introduces students to the fundamental laws and applications of the physical sciences within engineering and how to apply this knowledge to find solutions to a variety of engineering problems.	
Learning outcomes Upon completion of this unit, student will be able to: <ol style="list-style-type: none">1. Examine scientific data using both quantitative and computational methods.2. Determine parameters within mechanical engineering systems.3. Explore the characteristics and properties of engineering materials.4. Analyse applications of A.C./D.C. circuit theorems, electromagnetic principles and properties.	

Unit 4: Managing a Professional Engineering Project (A/615/1478)	Unit Type: Core
<p>Objectives Introduces students to the techniques and best practices required to successfully create and manage an engineering project designed to identify a solution to an engineering need.</p> <p><i>This unit is assessed by a Pearson-set assignment. The project brief will be set by the Centre, based on a theme provided by Pearson (this will change annually). The theme and chosen project within the theme will enable students to explore and examine a relevant and current topical aspect of professional engineering.</i></p> <p>Learning outcomes Upon completion of this unit, student will be able to:</p> <ol style="list-style-type: none"> 1. Formulate and plan a project that will provide a solution to an identified engineering problem. 2. Conduct planned project activities to generate outcomes which provide a solution to the identified engineering problem. 3. Produce a project report analysing the outcomes of each of the project processes and stages. 4. Present the project report drawing conclusions on the outcomes of the project. 	
Unit 19: Electrical and Electronic Principles (M/615/1493)	Unit Type: Specialist
<p>Objectives Develop students' knowledge and skills in the principles of electrical and electronic circuits and devices.</p> <p>Learning outcomes Upon completion of this unit, student will be able to:</p> <ol style="list-style-type: none"> 1. Apply an understanding of fundamental electrical quantities to evaluate simple circuits with constant voltages and currents. 2. Evaluate simple circuits with sinusoidal voltages and currents. 3. Describe the basis of semiconductor action, and its application to simple electronic devices. 4. Explain the difference between digital and analogue electronics, describing simple applications of each. 	
Unit 17: Quality and Process Improvement (H/615/1491)	Unit Type: Optional
<p>Objectives Introduces students to the importance of quality assurance processes in a manufacturing or service environment and the principles and theories that underpin them.</p> <p>Learning outcomes Upon completion of this unit, student will be able to:</p> <ol style="list-style-type: none"> 1. Illustrate the applications of statistical process control when applied in an industrial environment to improve efficiency. 2. Analyse cost effective quality control tools. 3. Determine the role of standards in improving efficiency, meeting customer requirements and opening up new opportunities for trade. 4. Analyse the importance of Total Quality Management and continuous improvement in manufacturing environments. 	

Unit 20: Digital Principles (T/615/1494)	Unit Type: Optional
<p>Objectives Develop students' knowledge and skills in the principles of digital electronic circuits.</p> <p>Learning outcomes Upon completion of this unit, student will be able to:</p> <ol style="list-style-type: none"> 1. Explain and analyse simple combinational logic circuits. 2. Explain and analyse simple sequential logic circuits. 3. Describe and evaluate the technologies used to implement digital electronic circuits. 4. Describe and analyse a range of digital subsystems, hence establishing the building blocks for larger systems. 	
Unit 22: Electronic Circuits and Devices (F/615/1496)	Unit Type: Optional
<p>Objectives Introduces students to the use of electronics manufacturers' data to analyse the performance of circuits and devices, the operational characteristics of amplifier circuits, the types and effects of feedback on a circuit performance, and the operation and application of oscillators. They will also be introduced to the application of testing procedures to electronic devices and circuits, and use the findings of the tests to evaluate their operation.</p> <p>Learning outcomes Upon completion of this unit, student will be able to:</p> <ol style="list-style-type: none"> 1. Determine the operational characteristics of amplifier circuits. 2. Investigate the types and effects of feedback on an amplifier's performance. 3. Examine the operation and application of oscillators. 4. Apply testing procedures to electronic devices and circuits. 	

Entry Requirements:

- Applicants who are at least 18 years of age must satisfy at least one of the following requirements:
 - Minimum 1 GCE 'A' Level passes; or equivalent; or
 - Pearson BTEC Level 3; or equivalent.
- Applicants who do not meet the above entry requirements are required to pass in ELITC Technical Entrance Test and/or an interview to be conducted by ELITC.
- Mature applicants (at least 30 years of age) with minimum 8 years of relevant working experience but do not possess the required qualifications will be considered on a case by case basis.
- Applicants should be free from colour appreciation deficiency.

Language Proficiency:

- Applicants must have English Language Proficiency with IELTS (International English Language Testing System) score of at least 5.50; or a level of competence equivalent to a TOEFL (Test of English as a Foreign Language) score of 500; or who have successfully completed at least 2 years of schooling in English medium and had the required English Language competency.
- Applicants who do not meet the above English Language requirements are required to pass in ELITC English Proficiency Entrance Test and/or an interview to be conducted by ELITC.

Duration:

The total Guided Learning Hours (GLH) for 8 Units is 480 hrs. This programme is offered either as:

- **Full-time** over 9 months which comprises a total of 3 trimesters. All classes will be conducted from 9.00 am to 5.30 pm on weekdays.
- **Part-time** over 12 months which comprises a total of 4 trimesters. All classes will be conducted 2 sessions per week from 9.00 am to 4.00 pm or 2 evening sessions during weekdays from 6.30 pm to 9.30 pm and 1 weekend session from 9.00 am to 4.00 pm.

Training Medium:

This programme is conducted in English.

Training Methodology:

This programme is delivered through lectures, tutorials, lab, hands-on activities, role-plays, case studies, work assignments, group discussions.

Essential Requirements:

- Scientific Calculator: CASIO FX-570MS / CASIO FX-991MS / SHARP EL-506W / SHARP EL-520W
- Laptop

Assessment:

There is a range of assessment methods that can be utilised, such as:

- individual work assignment with/without presentation
- group work assignment with/without presentation
- written report with/without presentation
- practical assessment and/or written assessment

BTEC Higher Nationals in Engineering are assessed using a combination of internally assessed centre-devised internal assignments (which are set and marked by the Centre) and internally assessed Pearson-set assignments (which are set by Pearson and marked by the Centre). Pearson-set assignments are mandatory and target particular industry-specific skills. For the Level 4 HNC, one core, 15 credits, unit at Level 4 will be assessed by a mandatory Pearson-set assignment targeted at particular skills; all other units are assessed by centre-devised assignments.

Grading System:

Each successfully completed unit will be graded a **Pass, Merit or Distinction**.

Unit Grade	Generic Grade Descriptors
Pass	<ul style="list-style-type: none">• All learning outcomes and associated assessment criteria have been met
Merit	<ul style="list-style-type: none">• Pass requirements achieved• All merit grade descriptors achieved through high performance in each learning outcome
Distinction	<ul style="list-style-type: none">• Pass and merit requirements achieved• All distinction grade descriptors achieved through outstanding performance across the unit as a whole

Certification:

To achieve a Pearson BTEC Level 4 Higher National Certificate (HNC) qualification, student must have completed units which is equivalent to 120 credits and achieved at least a pass in 105 credits at Level 4 within 2 years from the registration date.

Student must satisfy the minimum attendance requirements in all the units for the award of Statement of Attendance. Full-time Students, both local and international, must attain a minimum of 90% of scheduled unit hours or not be absent from the unit for consecutive 7 days. As for Part-time Students, the minimum attendance requirement is 80%.

Progression Pathway:

Successful students with Pearson BTEC Level 4 Higher National Certificate in Engineering (Electrical and Electronic Engineering) – RQF can progress into the Bachelor degree programme recommended by Pearson Education Ltd.

For more information, please visit the degree course finder from Pearson website: <https://degrecoursefinder.pearson.com>.

Career Prospects:

This programme helps students to gain employment opportunities in the manufacturing as well as the electrical or electronic engineering sector where students may move towards supervisory positions. This programme also serves as a good training route for students to switch into electrical or electronic engineering sector.